TECHNICAL REVIEW DOCUMENT FOR OPERATING PERMIT 960PMR177

to be issued to:

Young Gas Storage Company, Ltd.
Young Compressor Station
Morgan County
Source ID 0870051

Prepared by Doris Jung on August 31, 1998 Revised by Ashley Kendall on October 21, 1998

I. Purpose

This document establishes the basis for decisions made regarding the Applicable Requirements, Emission Factors, Monitoring Plan and Compliance Status of Emission Units covered within the Operating Permit proposed for this site. It is designed for reference during review of the proposed permit by the EPA and during Public Comment. The conclusions made in this report are based on information provided in the original application submittal of September 26, 1997 and additional information received by the construction permit group on October 26, 1998. This narrative is intended only as an adjunct for the reviewer and has no legal standing.

On April 16, 1998 the Colorado Air Quality Control Commission directed the Division to implement new procedures regarding the use of short term emission and production/throughput limits on Construction permits. These procedures are being directly implemented in all operating permits that had not started their Public Comment period as of April 16, 1998. All short term emission and production/throughput limits that appeared in the construction permits associated with this facility that are not required by a specific State or Federal standard or by the above referenced Division procedures have been deleted and all annual emission and production/throughput limits converted to a rolling 12 month total. Note that, if applicable, appropriate modeling to demonstrate compliance with the National Ambient Air Quality Standards was conducted as part of the Construction Permit processing procedures. If required by this permit, portable monitoring results and/or EPA reference test method results will be multiplied by 8760 hours for comparison to annual emission limits unless there is a specific condition in the permit restricting hours of operation.

Any revisions made to the underlying construction permits associated with this facility made in conjunction with the processing of this operating permit application have been reviewed in accordance with the requirements of Regulation No. 3, Part B, Construction Permits, and have been found to meet all applicable substantive and procedural requirements. This operating permit incorporates and shall be considered to be a combined construction/operating permit for any such revision, and the permittee shall be

allowed to operate under the revised conditions upon issuance of this operating permit without applying for a revision to this permit or for an additional or revised Construction Permit.

II. Source Description

This source is classified as a natural gas transmission and storage facility defined under Standard Industrial Classification 4922. This facility consists of three (3) reciprocating internal combustion engines, a triethylene glycol dehydrator, and a facility flare. The reciprocating engines are used to drive compressors which compress natural gas for injection into underground storage during off-peak delivery periods or for delivery to pipeline during periods of peak demand. Natural gas may be dehydrated by the dehydration unit and/or processed to remove natural gas liquids. The natural gas liquid product is collected, stored in tanks and transported offsite via trucks. The facility flare is used to combust the vent gases from the dehydration unit flash tank and still vent, fuel gas from the pilot light, and natural gas/natural gas liquid vapors from the emergency vent. Vent gases can be routed to the regenerator burner, reducing the burner's natural gas fuel consumption. The facility emits fugitive emissions from equipment leaks.

The facility is located approximately 3.5 miles north of Interstate 76 on County Road 17. The area in which the plant operates is designated as attainment for all criteria pollutants. There are no affected states within 50 miles of the plant. There are no Federal Class I designated areas within 100 kilometers of the plant. Facility wide emissions for pollutants of concern, Nitrogen Oxides (NO_x), Carbon Monoxide (CO), Volatile Organic Compounds (VOC), and Hazardous Air Pollutants (HAPs) in tons per year (tpy) are as follows:

Pollutant	Potential to Emit (tpy)	Actual Emissions (tpy)
NO_x	94.1	94.1
CO	148.4	148.1
VOC	106.6	106.6
HAPs	33.1	33.1

Facility wide potential emissions and actual emissions are based on data submitted with the Title V Operating Permit application.

This source is considered to be a minor source (Potential to Emit < 250 tpy) for purposes of Prevention of Significant (PSD) as defined in Colorado Regulation No. 3, Part A, Section I.B.58. This facility currently has no applicable MACTs. However, a MACT for Oil and Natural Gas Production and Natural Gas Transmission and Storage is scheduled to be promulgated in the future. Young Gas Storage Company Ltd. (YGS) indicated that 112(r) is applicable to this facility and certified to operating in compliance with all applicable requirements at the time of their application submittal on September 26, 1997.

III. Emission Sources

The following sources are specifically regulated under the terms and conditions of the Operating Permit for this Site:

Units CG-7100, CG-7200, CG-7300 - Superior 4-Cycle Low NO_x Internal Combustion Engines, Model 12SGTB, S/N 32543, 32544, and 32545, 15.0 MMBtu/hr, 7,500 Btu/hp-hr, 2000 hp, Natural Gas Fired.

1. Applicable Requirements

Units CG-7100, CG-7200, CG-7300 were first placed in service in 1994. They are permitted under final approval Colorado Construction Permits 94MR130-1, 2, 3. The applicable requirements for **each** engine are as follows:

- NO_x: 29.0 tpy (Colorado Construction Permits 94MR130-1, 2, 3)
- CO: 36.7 tpy (Colorado Construction Permits 94MR130-1, 2, 3)
- VOC: 19.4 tpy (Colorado Construction Permits 94MR130-1, 2, 3)
- Fuel use limited to 147.04 MMscf/yr (Colorado Construction Permits 94MR130-1, 2, 3)
- 20% Opacity limitation during normal operations (Regulation No. 1, Section II.A.1)
- APEN Reporting (Regulation No. 3, Part A, Section II)

2. Emission Factors

Emissions from these engines are produced during the combustion process, and are dependent upon the air to fuel ratio adjustment, engine design specifications, and specific properties of the natural gas being burned. The pollutants of concern are NO_x , CO and VOC. For permitted engines, it is Division policy to convert horsepower-based emission factors to fuel-based emission factors. The emission factor conversion is accomplished by using the horsepower-based emission factor, the design heat rate of the engine, and the engine horsepower as shown in the attached Engineering Calculation Worksheet. The AP-42 (EPA Compilation of Air Pollutant Emission Factors, October 1996) emission factors for 4-cycle rich-burn reciprocating engines from Table 3.2-1 and the manufacturer's emission factors for the engine are as follows:

Pollutant Pollutant	AP-42 (lb/MMBtu)	Manufacturer's (lb/MMBtu)
NO_x	2.3	0.44
CO	1.6	0.56
VOC	0.03	0.29

The manufacturer's emission factors are lower than the AP-42 factors for NO_x and CO, and higher for VOC.

3. Monitoring Plan

Emissions will be determined by multiplying the manufacturer's emission factors by fuel consumption. YGS will be required to conduct the emissions calculations on a monthly basis with semi-annual reports and an annual compliance certification.

Since the NO_x and CO compliance emission factors for these engines are less than AP-42 emission factors, quarterly portable monitoring is required as indicated by the Internal Combustion engine monitoring grid developed by the Division (attached). Failure of a portable analysis indicates a possible exceedance and a re-test is required using calibration gasses. Failure to show compliance during subsequent retests requires notification of the Division and an EPA Reference Method stack test must then be performed.

The Opacity standard of 20% will be monitored by the use of natural gas. Inspectors may verify this with EPA Method 9 opacity readings, if necessary.

A revised APEN must be submitted to the Division as required by Regulation No. 3, Part A, Section II.C.

4. Compliance Status

Current APENs reporting actual criteria emissions for the 1997 data year are on file with the Division for these engines. No records indicating non-compliance were found in a review of the facility's APCD files and the source certified in their application that they are currently in compliance with all applicable requirements. Therefore, these units are considered to be in compliance with all current applicable requirements.

Unit Dehy - Propak Systems Triethylene Glycol Dehydrator, Serial No. E8360, 200 MMscf/day capacity.

Flare - NMEC-AA-NAO Smokeless Flare, 192 MMBtu/hr.

1. Applicable Requirements

The glycol dehydrator and flare were placed in service in 1994 and are permitted under the initial approval Colorado Construction Permit 94MR130-4. The glycol dehydrator still vent and flash tank off gases are routed to the flare and combusted. The dehydrator operates under two main scenarios, Scenario 1 (low volume) and Scenario 2 (high volume). Pilot gas and emergency blow down process natural gas are also routed to the flare and combusted. The applicable requirements for the glycol dehydrator and flare are as follows:

- NO_v: 7.1 tpy (Colorado Construction Permit 94MR130-4)
- CO: 38.3 tpy (Colorado Construction Permit 94MR130-4)
- VOC: 38.8 tpy (Colorado Construction Permit 94MR130-4)
- Natural gas processed by the dehydrator shall not exceed 37,788 MMscf/yr (Colorado Construction Permit 94MR130-4)
- Combustion of gases by the flare shall not exceed 196.8 MMscf/yr (Colorado Construction Permit 94MR130-4)
- APEN Reporting (Regulation No. 3, Part A, Section II)

The due date of the first semi-annual monitoring report required by this operating permit will be more than 180 days after the initial approval construction permit was issued and/or

the equipment commenced operation. Therefore, the Division considers that the Responsible Official certification submitted with that report will serve as the self-certification for Colorado Construction Permit 94MR130-4 and the appropriate provisions of the construction permit have been directly incorporated into this operating permit.

2. Emission Factors

Pilot gas and emergency blow down process natural gas combusted by the flare generate NO_x , CO, and VOC emissions. The following emission factors shall be used to determine NO_x , CO, and VOC emissions.

<u>Pollutant</u>	Emission Factor (lb/MMscf)
NO _x	71.4
CO	388.5
VOC	35.7

Triethylene glycol is contacted with the natural gas stream to remove moisture. This mixture is heated in the still vent portion of the unit which drives off the water and some entrained VOC. Emissions from this process and the flash tank off gases are typically predicted using the Gas Research Institute's GLYCalc Model Version 3.0 or higher. Emission factors for VOC and various HAPs from the dehydrator are dependent upon the variables input into this Model. These variables include inlet gas temperature and pressure, glycol recirculation rate, stripping gas rate, cubic feet of gas processed, and percentage breakdown by weight of constituents in the natural gas. Emissions from the dehydrator are controlled by the flare. A control efficiency of 95% for glycol dehydrator VOC emissions is assumed for the flare. NO $_{\rm x}$ and CO generated from the combustion of dehydrator VOC emissions by the flare may be estimated with the NO $_{\rm x}$ and CO emission factors listed above.

The heater for this unit is rated at 4.5 MMBtu/hr and falls under the insignificant activity category of Regulation No. 3, Part C, Section II.E.3.k. Therefore, emissions from the heater are not considered for the Operating Permit.

3. Monitoring Plan

Emissions from combusting pilot gas and emergency blowdown process natural gas will be determined by multiplying the emission factors described above by flare consumption of pilot gas and emergency blowdown process natural gas.

YGS will use the GRI GLYCalc Model Version 3.0 or higher, as necessary, to predict monthly controlled emissions of VOC and HAPs from the still vent and flash tank of this dehydration unit and to determine compliance with VOC emission limitations. Daily recording of inlet gas temperature, pressure and flow rate, glycol recirculation rate, gas stripping rate and quarterly withdrawal period analysis of the gas composition, will be conducted as outlined in Condition 2.2 of the Draft Operating Permit to compare to established worst-case parameters. Frequency of extended gas analyses shall move to

semi-annual after the first year if BTEX concentrations remain below the comparison criteria. Frequency of extended gas analyses shall move from semi-annual to annual if BTEX concentrations remain below the comparison criteria for two consecutive semi-annual periods.

YGS can operate the dehydration equipment in low volume and high volume modes. The high volume mode of operation will occur for less than 2,500 hours per year. YGS will track the hours of operation at each volume mode and record once per day dehydrator operating parameter values which will be compared to threshold values. Failure of comparison with any one threshold value criterion will trigger the execution of GLYCalc 3.0 to determine compliance.

VOC emissions generated by the combustion of pilot gas and emergency blowdown process natural gas and controlled dehydrator VOC emissions shall be summed to determine compliance.

YGS will be required to conduct the emissions calculations on a monthly basis with semiannual reports and an annual compliance certification.

A flame indicating device must be installed and used on the flare to ensure a flame is present at all times. The dehydrator shall not be operated if no flare is present.

Daily visual emission observations shall be taken on the flare. If visual emissions proceed for more than five (5) minutes a method 9 reading shall be performed.

A revised APEN must be submitted to the Division as required by Regulation No. 3, Part A, Section II.C.

4. Compliance Status

A current APEN reporting actual criteria emissions for the 1997 data year is on file with the Division for this unit. No records indicating non-compliance were found in a review of the facility's APCD files and the source certified in their application that they are currently in compliance with all applicable requirements. Therefore, this unit is considered to be in compliance with all current applicable requirements.

Unit FUG - Fugitive VOC Emissions from Equipment Leaks

1. Applicable Requirements

The Division has made the determination that Fugitive VOC emissions from equipment leaks at gas compression or processing facilities must be calculated and evaluated for the appropriate permitting requirements. This plant meets the definition of a Onshore Natural Gas Processing Facility in 40CFR60 Subpart KKK which contains requirements for inspection and monitoring of fugitive leaks at these facilities. Fugitive VOC emissions from equipment leaks are permitted under Colorado Construction Permit 94MR130-6. The

applicable requirements are as follows:

- VOC: 4.2 tpy (Colorado Construction Permit 94MR130-6)
- APEN Reporting (Regulation No. 3, Part A, Section II)

Short and long term fuel throughput limitations, hourly VOC emission limitations and specified component counts from the Initial Approval Permit have not been incorporated into the Operating Permit as conditions. The Division has determined that an hourly fugitive VOC emission limit is not enforceable as a practical matter unless conditions are imposed requiring use of leak detection devices on each component. This is more than is required by Subpart KKK of the NSPS for this site. Fuel throughput limitations do not directly relate to fugitive emissions, and therefore are unnecessary in the Operating Permit. A limit on specific components restricts flexibility. As long as the source can demonstrate that they are under their annual limit for VOC, no restriction on the specific number of each component is required in the Operating Permit.

The due date of the first semi-annual monitoring report required by this operating permit will be more than 180 days after the initial approval construction permit was issued and/or the equipment commenced operation. Therefore, the Division considers that the Responsible Official certification submitted with that report will serve as the self-certification for Colorado Construction Permit 94MR130-6 and the appropriate provisions of the construction permit have been directly incorporated into this operating permit.

2. Emission Factors

YGS has calculated emissions from equipment leaks based on emission factors from EPA's Protocol for Emission Leak Estimates (EPA 453-4/R-93-025). Factors are multiplied by the number of components of each type (e.g. Compressor Seals) and the VOC weight percentage in the organic portion of the gas stream as determined in the most recent analysis. EPA factors are given in terms of Total Organic Compounds.

3. Monitoring Plan

As a means of recordkeeping, YGS personnel must conduct an initial component count within 90 days of permit issuance to verify the existing hardware inventory. Records shall be kept of all component additions and deletions, and a running tally maintained. The calculation result will be compared to the annual VOC limit to determine compliance. In addition, a report detailing the steps that are and will be taken to demonstrate compliance with Subpart KKK of the New Source Performance standards is usually required in the operating permit, however this source has already indicated specific applicable and non-applicable requirements provided to the Division on August 21, 1997.

4. Compliance Status

A current APEN reporting actual criteria emissions for the 1997 data year is on file with the Division for fugitive emissions. No records indicating non-compliance were found in a

review of the facility's APCD files and the source certified in their application that they are currently in compliance with all applicable requirements. Therefore, this unit is considered to be in compliance with all current applicable requirements.

IV. Insignificant Activities

Emergency Generator

The emergency generator on site has been identified as meeting the insignificant activity criteria of Regulation No. 3, Part C, Section II.E.3.nnn.

Fuel Burning Equipment

YGS identified combustion sources that qualify as insignificant activities under Regulation No. 3, Part C, Section II.E.3.k, gaseous fuel burning equipment with a design heat rate less than 5 MMBtu/hr. These units are listed in Appendix A in the Operating Permit.

Storage Tanks

YGS identified storage tanks that qualify as insignificant activities under Regulation No. 3, Part C, Section II.E.3.a, aaa, ddd, and ooo, zz. These units are listed in Appendix A in the Operating Permit.

Drain Sumps

Drain sumps on site have been identified as meeting the insignificant activity criteria of Regulation No. 3, Part C, Section II.E.3.a.

V. Alternative Operating Scenarios

The source has requested temporary and permanent engine replacement flexibility. The Division's Compressor Engine Alternative Operating Scenario has been incorporated into the operating permit.

VI. Permit Shield

YGS provided a list of citations identified as not applicable to this source. They are listed in Section III of the Operating Permit.

VII. Short Term Limits Deleted from Operating Permit

Construction Permit	Emission Unit	Short Term Limit
94MR130-4	Dehy and Flare	NO _x : 0.6 ton/mo
		CO: 3.2 ton/mo
		VOC: 3.3 ton/mo
		Dehy Throughput: 3149 MMscf/mo
		Fuel Combusted: 16.4 MMscf/mo